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Commentary

Keeping an eye on the planet

As Orville Wright broke the bounds of Earth over the North Carolina beach fulfilling his goal of taking humans to the skies, he surely could not have imagined that a century later aircraft would be designed for the sole purpose of keeping people on the ground. However, that is exactly what unmanned aircraft systems (UAS) are doing today in many new and exciting ways.

In the civil sector, the increasing need for Earth observation data has largely fueled this shift toward UAS platforms. Through routine and extreme weather forecasting, resource management, and environmental forecasting, Earth observation technologies are revolutionizing the way we understand the planet.

But that data is only as good as the coverage that exists in the observation networks, and until recently our network of sensors on the ground and on board satellites left a gaping hole in coverage. Through a variety of demonstration projects over the past three years, UAS have proven capable of filling some crucial gaps and taking on missions not suitable for humans. As the technological maturity of UAS continues to increase, they also have the potential as a lower cost alternative to traditional research and operational missions.

NOAA has learned a great deal about the potential uses of UAS, their capabilities, and the ways in which they could help us meet challenges, create solutions, and produce results. They have flown missions inside a tropical storm, assessed fisheries resources, charted coastline, and tracked entangled whales.

Last year, NOAA teamed with partners at NASA, the Dept. of Agriculture, and General Atomics on a demonstration project designed to improve fire weather prediction. As much of the U.S. continues to suffer through a drought, the ability to quickly detect, predict, and combat wildfires can mean the difference between life and death for millions in these affected regions.

UAS can improve NOAA's existing spot weather forecasts by gathering site-specific data on fire weather conditions such as hot spots within a fire and transmitting that data to fire weather forecasters and those responsible for coordinating firefighting resources. The long flight times of UAS are particularly well suited to surveying fires that occur in remote areas.

In addition to helping to forecast fire weather, UAS could help with predicting the threat of fires. NOAA scientists in Alaska analyze meteorological and soil moisture data to predict forest fire potential and issue fire warnings. UAS could potentially play a role in fire prediction by providing more meteorological data to validate fire advisory models.

NOAA is planning to include major missions over the Arctic to better anticipate changes to Arctic climate and ecosystems, over and around hurricanes to better understand and predict their intensity and track, and over the Pacific to help monitor and protect our unique natural resources in the Northwest Hawaiian Islands National Monument and improve Pacific storm prediction.

The potential of unmanned aircraft systems in the 21st century is every bit as great as that of manned flight when the Wrights performed their first successful tests at the dawn of the 20th century. Then, as now, the bounds of imagination and ingenuity are the only limits to the potential of this technology. It has become clear, however, that UAS will play an integral role in the future of how we observe and forecast the environment in which we live.

V. Adm. Conrad C. Lautenbacher Jr. (Ret.)

Administrator, National Oceanic and Atmospheric Administration